APPENDIX E

PROTECTED SPECIES TECHNICAL MEMORANDUM

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Technical Memorandum

Date:	Wednesday, June 17, 2015		
Project:	N-12 Niobrara East and West EIS	Job No.	84534
To:	Project File		
From:	HDR		
Subject:	Protected Species		

I. Introduction

The U.S. Army Corps of Engineers (Corps) is preparing an environmental impact statement (EIS) for the proposed reconstruction of the Nebraska Highway 12 (N-12) roadway east and west of the Village of Niobrara (Niobrara), Nebraska (Project). Because the Project would have impacts on regulated waters of the U.S. and would require a Clean Water Act Section 404 permit, and because no other federal action is required, the Corps is the lead federal agency for compliance with the National Environmental Policy Act (NEPA).

The purpose of this technical memorandum is to characterize the existing conditions and potential effects of the Project and alternatives on federally and state-listed protected species. The information presented in this technical memorandum is used to describe the existing conditions and associated impacts on alternatives carried forward for analysis in the N-12 Draft EIS. This technical memorandum has been developed prior to completion of alternative screening. Therefore, the full range of alternatives has been evaluated. Detailed information on the purpose of and need for the Project and on the alternatives carried forward for analysis is provided in the N-12 Draft EIS. The range of alternatives evaluated in this technical memorandum are:

- No Action – Section 404 permit denied or withdrawn; new roadway not constructed
- Alternative A1 – Elevation raise on the existing N-12 alignment
- Alternative A2 – Elevation raise parallel to the existing N-12 alignment
- Alternative A3 – New roadway along the base of the Missouri River bluffs
- Alternative A7 – Same alignment as Alternative A3 but with 1.8 miles of bridges incorporated

II. Affected Environment

A. Regulatory Background

The following sections discuss the relevant federal and state regulations regarding threatened or endangered species.

Relevant Federal Regulations

The Endangered Species Act of 1973, as amended (ESA) (16 United States Code [USC] 1531 et seq.), protects federally listed threatened or endangered species. The ESA defines an endangered species as "a species in danger of becoming extinct throughout all or a large portion of its range" and a threatened species as "a species likely to become endangered in the foreseeable future" (50 Code of Federal Regulations [CFR] 17.3). Section 4 of the ESA prohibits "take" of any federally listed species. Take is defined by the ESA as follows: "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" wildlife. The U.S. Fish and Wildlife Service (USFWS) has the authority of the federal government to administer the protection of such species. In addition, consideration of federal species of concern[1] and former candidate species[2] is required under the Wild and Scenic Rivers Act (16 USC 1271-1287).

Specifically Section 7 of the ESA, called "Interagency Cooperation," is the mechanism by which Federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any listed species. Under Section 7, Federal agencies must consult with the U.S. Fish and Wildlife Service (Service) when any action the agency carries out, funds, or authorizes (such as through a permit) may affect a listed endangered or threatened species. This process usually begins as informal consultation. A Federal agency, in the early stages of project planning, approaches the Service and requests informal consultation. Discussions between the two agencies may include what types of listed species may occur in the proposed action area, and what effect the proposed action may have on those species.

If the Federal agency, after discussions with the Service, determines that the proposed action is not likely to affect any listed species in the project area, and if the Service concurs, the informal consultation is complete and the proposed project moves ahead. If it appears that the agency's action may affect a listed species, that agency may then prepare a biological assessment to assist in its determination of the project's effect on a species (USFWS 2015a).

The Bald and Golden Eagle Protection Act (BGEPA) (16 USC 668a-d), originally passed in 1940, prohibits the take, possession, transport within the United States, import, export, purchase, sale, trade, barter, or offer for purchase, sale, trade, or barter any bald eagle (*Haliaeetus leucocephalus*) or golden eagle (*Aquila chrysaetos*), alive or dead, including any part, nest, or egg, unless allowed by permit (50 CFR 22). Take is defined by the BGEPA as the following: to "pursue, shoot, shoot at, poison, wound, kill, capture, trap,

1 "Species of concern" is an informal term that refers to those species that USFWS believes might be in need of concentrated conservation actions. Such conservation actions vary depending on the health of the populations and degree and types of threats. Species of concern receive no legal protection (USFWS 2009a).

2 "Candidate species" are plants and animals for which USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities (USFWS 2011).

collect, molest or disturb" a bald or golden eagle. The term "disturb" under the BGEPA means "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (72 Federal Register [FR] 31132). USFWS has the authority of the federal government to administer the BGEPA.

The Migratory Bird Treaty Act (MBTA) (16 USC 703-712) protects migratory birds, including raptors, and their active nests. Specifically, the MBTA prohibits activities that may harm migratory birds, their young, or their eggs, including the removal of active nests that results in the loss of eggs or young. In Nebraska, most nongame birds, with the exception of rock dove (pigeon) (*Columba livia*), house sparrow (*Passer domesticus*), and European starling (*Sturnus vulgaris*), are protected under the MBTA.

Relevant State Regulations

The State of Nebraska has established the Nebraska Nongame and Endangered Species Conservation Act (NESCA) (Nebraska Revised Statutes [Neb. Rev. Stat.] §37-806), which is administered by the Nebraska Game and Parks Commission (NGPC). NESCA states that any species listed under the ESA shall also be state listed. NGPC has the authority to list any species of wildlife or plants normally occurring within the state as threatened or endangered and subject to NESCA (Neb. Rev. Stat. §37-806). NESCA requires state agencies to consult with NGPC and take action necessary to ensure that actions authorized, funded, or carried out by the agencies do not jeopardize the continued existence of listed threatened or endangered species or result in the destruction or modification of habitat of such species that are determined by NGPC to be critical (Neb. Rev. Stat. §37-807).

B. Study Area

The Study Area for reviewing impacts on protected wildlife and plant species for the Project extends west to the town of Verdel, Nebraska, and east to the intersection of N-12 and County Road 531. The Study Area includes all alternative alignments and adjacent habitats. See Figure 1 for the Study Area. Note: The Study Area differs from the Action Area used to assess Alternative A7 impacts in the Biological Assessment (see Appendix L).

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Verdel
Ponca Creek
West Segment
Harry Miller Creek
Knox County
Niobrara River
Medicine Creek
NIOBRARA STATE PARK
Niobrara
Missouri River
Chief Standing Bear Memorial Bridge
Bon Homme County
SOUTH DAKOTA
LEWIS AND CLARK LAKE
Bazile Creek
East Segment
SANTEE SIOUX NATION
NEBRASKA
Bingham Creek
Verdigre Creek
Burgess Creek
54D
37
12
14

Knox County, Nebraska

Aerial Imagery: 2006 NAIP, Knox County, Nebraska

Legend

- N-12 Segments
- Nebraska Highway 12
- Roads
- Study Area
- Waterways
- City Limits
- Counties
- Wildlife Management Areas
- Recreational River Boundary
- Santee Sioux Nation
- Niobrara State Park

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Miles

Project Study Area

N-12 Niobrara East and West
Knox County, Nebraska
Environmental Impact Statement

NEBRASKA 12 N-12 Niobrara East & West

DATE
July 2015

FIGURE
1

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The designated Study Area for reviewing impacts on threatened or endangered fish and mussels includes all water bodies potentially affected by the action alternatives. The water bodies include Bazile Creek, Ponca Creek, Harry Miller Creek, Medicine Creek, other unnamed tributaries to the Missouri River, and the floodplain wetlands that are connected to the Missouri River. The Missouri River main channel and the Niobrara River are not located within the right-of-way (ROW) of any of the alternatives.

C. Existing Conditions

The Missouri River, its associated waterways, and the adjacent floodplains and bluffs provide diverse biological resources that support a variety of fish and wildlife species and populations. Habitat and the fish and wildlife species common to the Study Area are discussed in the Fish and Wildlife Technical Memorandum (see Appendix D).

Based on information provided by federal and state agencies, several threatened or endangered species may exist in the Study Area. USFWS provided the Corps with an updated list of species that are federally listed as threatened or endangered as well as designated critical habitat that might occur within or near the Study Area (USFWS May 1, 2015). In addition, NGPC provided the Corps with an updated list of state-listed species that could occur within or near the Study Area; all federally listed species are also state-listed (NGPC June 11, 2015). An updated preliminary search of the Nebraska Natural Heritage Database in June 2015 by NGPC found no records of natural communities within the Study Area. There are historical records of sturgeon chub and blacknose shiner (from 1893), but nothing recent. Finally, there are bald eagle nest sites within 0.5 mile of the Study Area (NGPC June 10, 2015).

The bald eagle has been removed from the USFWS federal threatened or endangered species list and from the State of Nebraska threatened or endangered species list. The bald eagle is still protected under the BGEPA and the MBTA; consequently, this species is discussed in this section. The project's effect on migratory birds is analyzed in Appendix D, Fish and Wildlife Technical Memorandum.

Table 1 lists the species identified by USFWS and NGPC, their status, their typical habitat, and their occurrence. Subsequent sections provide detailed information regarding each species listed.

Table 1
Protected Species that May Occur in the Study Area

Common Name	Scientific Name	Status[1]	Typical Habitat	Occurrence
Birds				
Bald eagle[2]	*Haliaeetus leucocephalus*	Protected under BGEPA	Mature riparian areas along streams, rivers, and permanent bodies of water	Winter roosting and nesting along the Missouri River, Niobrara River, and Lewis and Clark Lake; two nests recorded near the Study Area
Interior least tern	*Sterna antillarum athalassos*	Endangered	Sparsely vegetated sandbars, sand and gravel shorelines of rivers, and alkali wetlands	Migration, summer breeding, and nesting on sandbars in Missouri and Niobrara rivers; may use wetlands within the Study Area for foraging
Piping plover	*Charadrius melodus*	Threatened	Sparsely vegetated sandbars, sand and gravel shorelines of rivers, and alkali wetlands	Migration, summer breeding, and nesting on sandbars in Missouri and Niobrara rivers; no known occurrences within the Study Area
Rufa red knot	*Calidris canutus rufa*	Threatened	Migratory stopovers include sandflats or mudflats	Migration on Missouri River is possible; no known occurrences within the Study Area
Whooping crane	*Grus americana*	Endangered	Spring and fall migration through central flyway, along Missouri and Niobrara Rivers, cropland and pasture, wet meadows, shallow marshes, and shallow areas in rivers, lakes, reservoirs, and stock ponds	Within the tributaries and wetlands located in the Study Area; no known occurrences within the Study Area

Common Name	Scientific Name	Status[1]	Typical Habitat	Occurrence
Insects				
American burying beetle	*Nicrophorus americanus*	Endangered	Riparian zone, mixed agricultural land (pastures and mowed land), grasslands, and woodland edge habitat	Western Knox County; no known occurrences within the Study Area
Fish				
Pallid sturgeon	*Scaphirhynchus albus*	Endangered	Main channel of turbid, free-flowing rivers, backwaters, chutes, and edges of sandbars	Missouri River, lower reaches of Niobrara River; no known occurrences within the Study Area
Lake sturgeon	*Acipenser fulvescens*	State-listed as endangered; federal species of concern	Main channel of turbid, free-flowing rivers, backwaters, chutes, and edges of sandbars	No known occurrences within the Study Area
Sturgeon chub	*Macrhybopsis gelida*	State-listed as endangered; federal species of concern	Main channel of turbid, free-flowing rivers, backwaters, chutes, and edges of sandbars	Missouri River downstream of Gavins Point Dam; no known occurrences within the Study Area
Mammals				
North American river otter	*Lutra canadensis*	State-listed as threatened	Wooded rivers and streams with sloughs and backwaters; ponded water areas; and year-round open water with rock, brush, and log piles	Niobrara River, upstream of the confluence with the Missouri River; no known occurrences within the Study Area
Northern long-eared bat	*Myotis septentrionalis*	Threatened	Summer colony habitat underneath bark, in cavities or in crevices of both live trees and snags (dead trees)	No known occurrences in the Study Area; listed by USFWS in the county
Plants				
Small white lady's slipper	*Cypripedium candidum*	State-listed as threatened	Moist to wet sedge-meadows, wet prairies, and wet-mesic tallgrass prairie	No known occurrences within the Study Area

Common Name	Scientific Name	Status[1]	Typical Habitat	Occurrence
Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Wet-mesic to mesic tallgrass prairie; unplowed sedge meadows	No known occurrences within the Study Area

Notes:
[1] Federal and state (Nebraska) status unless otherwise noted.
[2] This species is not federally listed as threatened or endangered under Section 7 of the Endangered Species Act; however, this species is federally protected under the Bald and Golden Eagle Protection Act (16 USC 668a-d).

Sources:
NatureServe, 2009. "NatureServe Explorer: An Online Encyclopedia of Life" [web application]. Version 7.1. Arlington, Virginia: NatureServe. Retrieved on February 6, 2009. http://www.natureserve.org/explorer.
NGPC. March 2014. Estimated Current Ranges of Threatened and Endangered Species: List of Species by County. Nebraska Natural Heritage Program. http://outdoornebraska.ne.gov/wildlife/programs/nongame/pdf/TandESpecies.pdf.
USFWS. 2015b. Endangered, Threatened, Proposed and Candidate Species, Nebraska Counties. Nebraska Field Office. March. http://www.fws.gov/nebraskaes/Library/NECounty2015.pdf.
USFWS. May 1, 2015. Letter from Eliza Hines, Nebraska Field Supervisor, USFWS, to Rebecca Latka, Project Manager, Corps.

For each federally and state-listed species or species of concern that may occur in the Study Area, the species occurrence, history, and habitat requirements were reviewed from current research reports, census reports, management and recovery plans, and conservation assessments. The following species accounts summarize the biology and occurrence of each species.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is a protected species under the BGEPA and the MBTA. On July 9, 2007, USFWS formally removed the bald eagle from the federal list of threatened or endangered species (72 FR 37345-37372), and in October 2008, the bald eagle was formally removed from the Nebraska threatened or endangered species list. There have been no critical habitat designations for the bald eagle. Consequently, none of the land within the Study Area is considered critical habitat.

Bald eagles can generally be found statewide in Nebraska but tend to occur most frequently along streams, rivers, and other permanent bodies of water, using mature riparian timber to perch while feeding and loafing. Migrating and wintering eagles may be found in Nebraska between November 1 and April 1. The Missouri River is a major wintering area for the bald eagle.

Habitat supporting the bald eagle is characterized by aquatic ecosystems. The bald eagle must have access to lakes, reservoirs, major rivers, and select seacoast habitats that have an abundant source of food, including fish, rabbits, turtles, snakes, other small mammals, and carrion, and that have adjacent riparian areas with large mature trees suitable for nesting and roosting (USFWS 2007a).

In North America, eagles migrate both north and south during the yearly climatic changes associated with the seasons of the year. The distance of migration depends on

the severity of the winter climatic conditions and subsequent available habitat for feeding. The bald eagle is associated with the Missouri River during annual migrations and throughout the winter where open water is present. The southward migration of bald eagles begins as early as October, and the wintering period extends from December to March.

During the winter, the bald eagle feeds on fish in open water areas created by dam tailwaters; in the warm effluents of power plant, municipal, and industrial discharges; or in power plant cooling ponds. The Missouri River floodplain is a major wintering area for the bald eagle due to the presence of large dead or dying cottonwood trees located along the banks of the river. Wintering eagles are most abundant along the Missouri River main stem. The frequency and duration of bald eagle use of these areas depends on the weather conditions and presence of ice. Bald eagles nest in Nebraska from mid-February through mid-August. They tend to nest in large trees with specific size and structure characteristics. Bald eagles usually nest in the same territories each year, often using the same nest repeatedly.

The NGPC 2013 Midwinter Bald Eagle Survey results indicate that bald eagles occur on a frequent and regular basis within and near the Study Area. The survey counts numbers of individuals along major watercourses and at large reservoirs on a target date (January 1 through 15) and segments the river stretches by major landmarks (usually bridges). Although numbers fluctuate widely from year to year in response to weather, results of the surveys reflect the general trend of increasing numbers. Because the Missouri River area is mainly used during migration and winter roosting, the number of bald eagles is dependent on the conditions, such as ice cover, water levels, and available roosting habitat (Dinan and Jorgensen 2013). NGPC also counts eagle nests within the state. In 2014, there were 111 documented active bald eagle nests in Nebraska (Jorgensen and Dinan 2014). A collection of the nests were documented along the Missouri River system and near the confluence of the Niobrara and Missouri rivers (NGPC 2008a). Overall trends for bald eagle populations are positive and continue to increase (Steenhof et al. 2008).

Interior Least Tern and Piping Plover

The population of the interior least tern (*Sterna antillarum athalassos*) was federally listed as endangered on May 28, 1985 (50 FR 21784-21792). On April 22, 2008, USFWS initiated a 5-year review of this species (73 FR 21643-21645). No critical habitat has been designated for the interior least tern.

The Northern Great Plains population of piping plovers (*Charadrius melodus*) was federally listed as threatened on December 11, 1985 (50 FR 50726-50734). On September 30, 2008, USFWS initiated a 5-year review of this species (73 FR 56860-56862), which was completed and summarized on September 29, 2009 (USFWS 2009c). Critical habitat was designated for this species on September 11, 2002 (67 FR 57638-57717), which included approximately 1,207.5 river miles in Montana, Nebraska, South Dakota, North Dakota, and Minnesota. The Nebraska portion of the critical

habitat, excluding critical habitat designated on the Missouri River, was vacated by the U.S. District Court on October 13, 2005 (U.S. District Court for the District of Nebraska 2005). There is currently no federally designated critical habitat for the piping plover within the State of Nebraska or in the Study Area.

The interior least tern and piping plover occur on the rivers in the vicinity of the Study Area. These species nest from mid-April to mid-August. Interior least terns nest in colonies on sand islands and sandbars in rivers. A key factor for nest site selection is continuous above-water exposure of the site for at least 100 days during the nesting period (Smith and Renken 1993). Suitable nesting locations contain little vegetation (less than 10 percent), with the vegetation present being less than 4 inches tall (Dirks et al. 1993).

Piping plovers arrive on breeding grounds between mid-April and mid-May (Prindiville-Gaines and Ryan 1988; Haig and Oring 1985). Piping plovers in the Midwest, similar to interior least terns, nest on the Missouri and Niobrara rivers and other Great Plains rivers and use dry, barren sandbars, beaches, and gravel pits for nesting. Suitable nesting areas often contain minimal vegetative cover of less than 25 percent (Ziewitz et al. 1992). The optimum range for vegetative cover on nesting habitat has been estimated at 0 to 10 percent (Armbruster 1986, as cited in NGPC 2008b). Piping plovers often strongly prefer nests to be initiated near objects, such as driftwood, stones, or plant debris (Haig and Elliot-Smith 2004). Warnock et al. (2002, as cited in Cohen et al. 2008) hypothesizes that such objects may serve as windbreaks or nest markers for the birds. Sandbar area and height are also important factors in nesting habitat selection for both piping plovers and interior least terns. Nesting piping plovers are commonly found within or near nesting interior least tern colonies; therefore, this species is considered a breeding associate of the interior least tern in the Missouri and Niobrara river systems. Interior least terns are true riverine species while piping plover are pioneering species that frequently colonize bare sand around lakes, reservoirs, and other waterbodies.

Interior least terns and piping plovers occur near the Study Area only during the breeding and nesting season (from late April through early August). Several interior least tern and piping plover nesting colonies are known to occur on the Missouri River between Fort Randall Dam and Lewis and Clark Lake (Corps 2009). Interior least terns and piping plovers also nest along the Niobrara River, between Spencer Dam and the confluence with the Missouri River (National Park Service [NPS] 2009).

Interior least tern and piping plover populations have been monitored annually by the Corps along the Missouri River since 1986 and along the Niobrara River by NPS since 2003. Continued annual monitoring efforts take place every summer when these birds are breeding and nesting on the rivers. Table 2 provides census counts of interior least tern and piping plover adults by year (2003 through 2014) and river segment. All adults, nests, and chicks recorded during the annual censuses were located either upstream or downstream of the Study Area. No adults, nests, or chicks have been located within the Study Area. Overall trends of interior least tern and piping plover populations fluctuate

depending on river flow and available habitat. Overall trends of interior least tern and piping plover populations fluctuate depending on river flow and available habitat. The Missouri River flood in 2011 impacted the numbers of interior least tern and piping plover on the Fort Randall segment in 2011; however, the populations have rebounded in 2012 through 2014. The Lewis and Clark Lake segment has maintained high population counts of both birds since 2008.

Table 2
Interior Least Tern and Piping Plover Adult Census Counts

Years Monitored	Missouri River				Niobrara River	
	Fort Randall[1]		Lewis and Clark Lake[2]		River Mile 0-15	
	Interior Least Tern	Piping Plover	Interior Least Tern	Piping Plover	Interior Least Tern	Piping Plover
2003	50	37	46	14	40	24
2004	71	42	13	0	64	36
2005	76	42	4	24	12	9
2006	55	37	0	4	112	54
2007	74	21	85	20	42	23
2008	58	26	225	57	30	31
2009	23	16	214	122	30	40
2010	10	6	272	152	39	30
2011	0	0	231	134	28	13
2012	87	43	211	179	23	10
2013	77	47	148	131	10	1
2014	99	106	131	186	19	1

Notes:

[1] The Fort Randall segment of the Missouri River consists of all Missouri River miles downstream of Fort Randall Dam to the confluence with the Niobrara River.

[2] The Lewis and Clark Lake segment of the Missouri River consists of all Missouri River miles downstream of the confluence with the Niobrara River to Gavins Point Dam.

Sources:

Corps. 2009. Personal communication between Greg Pavelka, Corps Biologist, and Melissa Marinovich, HDR. March 30.

NPS. 2009. Personal communication between Stephen K. Wilson, NPS Biologist, and Melissa Marinovich, HDR. June 30.

Corps. May 4, 2015. Personal communication between Chantel Cook, Corps Tern and Plover Monitoring Program Coordinator, and Meagan Schnoor, HDR.

NPS. May 5, 2015. Personal communication between Lisa Yager, NPS Biologist, and Meagan Schnoor, HDR.

The Study Area lies adjacent to a reach designated as critical habitat for the piping plover, which includes areas within the banks of the Missouri River and Lewis and Clark Lake between Fort Randall Dam and Gavins Point Dam. This designation was made on September 11, 2002, under recommendation of USFWS (67 FR 57638-57717). In order to be considered critical habitat, a specific area must exhibit one or more of the primary constituent elements for that habitat type. The primary constituent elements for riverine habitat are sparsely vegetated channel sandbars, sand and gravel beaches on sandbars, temporary pools on sandbars, and interface with the river (67 FR 57638-57717).

Although no current studies of interior least terns and piping plovers are occurring within the Study Area, several ongoing studies on these species are occurring within the Missouri River in association with the "U.S. Fish and Wildlife Service 2003 Amendment to the 2000 Biological Opinion on the Operation of the Missouri River Main Stem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project, and Operation of the Kansas River Reservoir System" (USFWS 2003 Amendment) (USFWS 2003).

As described in the USFWS 2003 Amendment, the Study Area is located with two segments of the Missouri River that are characterized as high priority for management opportunities for both the interior least tern and piping plover. The Corps' Emergent Sandbar Habitat program created 137 acres of nesting habitat for interior least terns and piping plovers from September 2008 through April 2009 within the Lewis and Clark Lake segment of the Missouri River (River Mile 827) (Corps 2010c). In 2010, both piping plovers and interior least terns nested only on the constructed sandbar complexes in Lewis and Clark Lake and did not nest on any natural sandbars in this segment (Corps 2010a). Planned construction of ESH in 2010 was precluded due to high river stages and discharges throughout the construction season (Corps, March 2011). The flood of 2011 created thousands of acres of ESH throughout the Missouri River, and no mechanical sandbar construction occurred. The Corps transitioned ESH funding to monitoring efforts for the MRRP and no additional ESH construction has taken place since 2009 (Corps, March 2012).

Potential Habitat in the Study Area

The wetlands that exist along the floodplains are known to be used by interior least terns for feeding. These wetlands provide habitat for small fish that interior least terns use for forage. No bare sand or gravel areas exist within the Study Area to provide nesting habitat for either interior least terns or piping plovers.

Rufa Red Knot

The rufa red knot (*Calidris canutus rufa*) is a shorebird that was federally designated as threatened on December 9, 2014 (50 CFR 17). The rufa red knot migrates annually between its breeding grounds in the Canadian arctic and its wintering regions in the southeast United States, northeast Gulf of Mexico, northern Brazil and the Tierra del

Fuego in South America. Rufa red knots use staging and stopover areas in the continental United States and Canada in its spring and fall migrations (50 CFR 17). Migratory stopovers are typically coastal zones that contain sandflats or mudflats. The species also frequents peat-rich banks, salt marshes, brackish lagoons, mangrove areas, and mussel beds. In these areas, the birds feed on mollusks, crustaceans and other invertebrates (Government of Canada 2015). Rufa red knots winter and migrate in large flocks and when they arrive at stopovers very thin, sometimes emaciated due to the long distances in flight. They eat constantly to gain enough weight to continue their migration, nearly doubling their weight at some stopovers (USFWS 2013). USFWS has records of rufa red knot occurring in Knox County and the bird is protected wherever found (USFWS 2015b).

Potential Habitat in the Study Area

Any sandbars or sandy shores along the Missouri River would provide adequate habitat. No bare sand or gravel areas exist within the Study Area.

Whooping Crane

The whooping crane (*Grus americana*) was federally listed as endangered on March 11, 1967 (32 FR 4001), and critical habitat was designated for this species on May 15, 1978 (43 FR 20938-20942). The critical habitat for this species is located along a 56-mile-long, 3-mile-wide stretch of the Platte River between Lexington and Shelton, Nebraska (Canadian Wildlife Service and USFWS 2007).

Whooping cranes can be found in South Dakota and Nebraska during fall and spring migrations. Whooping cranes migrate through South Dakota and Nebraska between early October and late November in the fall and mid-March to late May in the spring. A variety of habitats are used during migration, such as croplands and wetlands for feeding and shallow portions of rivers, lakes, and streams for roost sites (Austin and Richert 2005). Overnight roosting requires shallow water over submerged sandbars on which the cranes stand and rest. This species has shown a preference for unobstructed channels that are isolated from human disturbance (Armbruster 1990, as cited in Canadian Wildlife Service and USFWS 2007). Large palustrine wetlands are used for roosting and feeding during migration.

Today, most whooping cranes migrate from Wood Buffalo National Park in Canada to Aransas National Wildlife Refuge on the Texas coast. This route passes southeast through northeastern Alberta, south-central Saskatchewan, northeastern Montana, western North Dakota, western South Dakota, central Nebraska and Kansas, west-central Oklahoma, and east-central Texas. Scattered occurrences have been reported in adjacent states and provinces (Canadian Wildlife Service and USFWS 2007).

The migration path of the Aransas-Wood Buffalo flock that nests in northern Canada and migrates to the Gulf of Mexico passes through central Nebraska, mainly in the Platte River basin. Knox County is on the eastern edge of the main whooping crane

migration corridor. No sightings have been confirmed within the designated Missouri National Recreational River (MNRR), but a single whooping crane has been sighted in Knox County along Bazile Creek south of the Study Area, which is fairly unusual because it is east of the central flyway (USFWS 2009d). No studies for this species are currently being conducted within the Study Area.

Potential Habitat in the Study Area

The wetlands that exist along the floodplains and along Bazile Creek could be used for foraging by whooping cranes. These wetlands provide habitat for small fish, insects, and amphibians that whooping cranes use for forage. Use of this area would be migratory in nature. No submerged sandbars, which would provide roosting habitat, exist within the Study Area.

American Burying Beetle

The American burying beetle (*Nicrophorus americanus*) (ABB) was federally listed as endangered on July 13, 1989 (54 FR 29652-29655). On January 29, 2007, USFWS initiated a 5-year review of this species (72 FR 4018-4019), which was completed and summarized in March 2008 (USFWS 2008). No critical habitat has been designated for this species.

ABBs are active from late April through September (USFWS 1991). This species is nocturnal and is generally active only when nighttime temperatures exceed 60° Fahrenheit for several consecutive days. In South Dakota and Nebraska, the ABB is attracted to areas that have significant topsoil suitable for burial of carrion, on which it is dependent for food and reproduction. Optimal carrion size has been found to range from 3.5 to 7.0 ounces (USFWS 1991). The ABB is one of the largest carrion beetles and is a strong flier, which enables it to travel great distances.

Although the ABB's habitat is not clearly defined, captures suggest the possibility of riparian woodlands, mixed agricultural lands (including pastures and mowed fields), and grasslands (Ratcliffe and Jameson 1992). Habitats where ABBs currently occur in Nebraska consist of grassland prairie, forest edges, open woodlands with grasslands, and scrubland (USFWS 2008). Recent research suggests that the ABB is more of a generalist species, using a wider range of habitats than other burying beetles, and that the presence of appropriate soil for carrion burial is more important than habitat type. No strong correlations with soil type or land use have been identified for this species in Nebraska (Bishop et al. 2002); however, adequate soil moisture levels appear critical (Hoback 2008). Hoback's laboratory and field studies have shown that burying beetles, including ABBs, will seek and use moist soils during periods of inactivity.

ABBs have been found in the Sandhills of north-central Nebraska where there is sufficient carrion, even though sandy soils may make carrion burial difficult (Ratcliffe and Jameson 1992). The species was collected in 1993 and 1994 in Dawson, Lincoln, Keya Paha, and Cherry counties in Nebraska and has been identified in Tripp and Gregory

counties in South Dakota, but no confirmed sightings have been made along the 39-Mile District of the MNRR (NPS 1997). Numerous surveys have been conducted along the Missouri River in South Dakota, and all have failed to detect this endangered beetle. The only extant population known in South Dakota is in southwest Gregory and southern Tripp counties, approximately 100 miles west of Yankton (South Dakota Game, Fish and Parks 1997). Given the proximity of collections in Keya Paha and Antelope counties, Nebraska, and the ABB's ability to fly long distances in search of carrion, this species may be present in suitable habitats (USFWS 1991).

Potential Habitat in the Study Area

The bluff areas along the Missouri River could contain the most appropriate habitat for the ABB within the Study Area. These areas may contain suitable topsoil but may not have the amount of moisture the ABB prefers. All forested and range/pasture/grassland habitats in the Study Area are considered potential ABB habitat. See Figure 2 for detailed information on potential ABB habitat within the Study Area.

Pallid Sturgeon

The pallid sturgeon (*Scaphirynchus albus*) was federally listed as endangered on September 6, 1990 (55 FR 36641-36647). USFWS initiated a 5-year review of this species (72 FR 4018-4019), which was completed and summarized in June 2007 (USFWS 2007b). No critical habitat has been designated for this species; however, USFWS has designated Recovery Priority Management Areas (RPMAs) for this species to increase conservation efforts.

Pallid sturgeon are benthic (bottom dwelling) and considered to be well adapted for life on the river bottom in swift waters of large turbid, free-flowing rivers (USFWS 1993). Studies of the retina of pallid sturgeon indicate adaptation to a turbid environment (Sillman et al. 2005). This species evolved in the diverse and ephemeral environments of the Missouri and Mississippi rivers. The transition zone between the vegetated floodplain and the main channel includes habitats with variable depths described as chutes, sloughs, and side channels. While most habitat descriptions are based on fish in the juvenile or adult life stage, the habitat used by different life stages of pallid sturgeon varies widely (Wildhaber et al. 2007).

Shovelnose sturgeon are treated as threatened where the two species, pallid and shovelnose, coexist, under the similarity of appearance provisions of the ESA (75 FR 53598-53606). Because pallid and shovelnose sturgeon occupy a similar ecological niche, there are shovelnose-pallid hybrids that appear morphologically intermediate (USFWS 2014).

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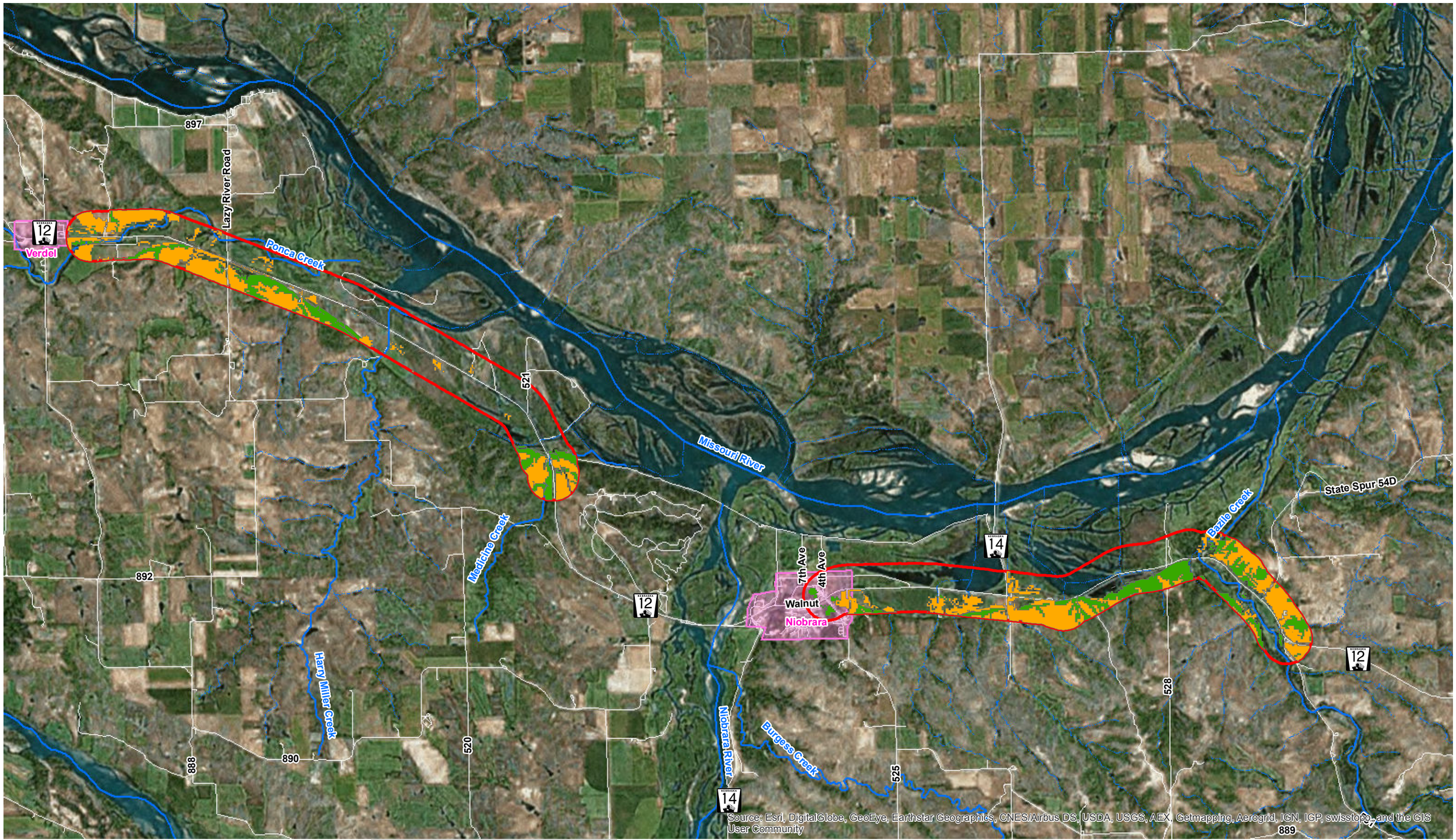

Legend

Action Area

Potential ABB Habitat by Land Cover Type

Range, Pasture, Grass - 911.68 Acres = 37.5 %

Woodland - 466.85 Acres = 20.1 %

0 0.5 1
Miles

Potential American Burying Beetle (ABB) Habitat

N-12 Niobrara East and West
Knox County, Nebraska
Biological Assessment

NEBRASKA 12
N-12 Niobrara East & West

DATE
July 2015

FIGURE
2

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In the lower Missouri River, downstream from Gavins Point Dam to the confluence with the Mississippi River, pallid sturgeon have been documented in areas near wing dikes (Jacobson et al. 2007; Jacobson and Laustrup 2000; Laustrup et al. 2007; all as cited in Peters and Parham 2008). In the upper Missouri and Yellowstone rivers, studies have found that pallid sturgeon were commonly located in areas with sandbars and sandy substrates (Bramblett 1996; Bramblett and White 2001; Tews 1994; all as cited in Peters and Parham 2008). Most studies have shown that pallid sturgeon prefer to inhabit the deepest water available. A study done on juvenile pallid sturgeon in a laboratory flume found the fish to be using deep water habitats (from 28.7 to 36.6 inches [73 to 93 centimeters]) more than expected (Allen et al. 2007). A range of water depths where pallid sturgeon were found in the Missouri River in South Dakota were approximately 13 to 16 feet (4 to 5 meters) in depth (Erickson 1992). Juvenile pallid sturgeon in the Yellowstone and upper Missouri rivers inhabited depths that averaged approximately 7.5 to 8.1 feet (2.3 to 2.5 meters) (Gerrity et al. 2005; Gerrity et al. 2008; both as cited in Peters and Parham 2008). Adults in these same areas were using depths between approximately 3 and 47.5 feet (0.9 and 14.5 meters) (Bramblett 1996; Bramblett and White 2001; both as cited in Peters and Parham 2008). Results from a pallid sturgeon habitat assessment study conducted in the Fort Randall segment of the Missouri River indicate that pallid sturgeon in this segment prefer to inhabit locations with deeper than average available habitat (Elliot et al. 2004).

Generally, pallid sturgeon have been found in the Missouri River in deep pools at the downstream ends of chutes and sandbars in the slower currents (USFWS 1993). Findings from a study on the Missouri River in South Dakota indicate that pallid sturgeon most frequently occupy river bottoms where velocity ranges from 0.3 to 1.0 foot per second (0.10 to 0.30 meters per second) (Erickson 1992). This species is most often caught over sandy bottom areas, which is the predominant bottom substrate within the species range on the Missouri and Mississippi rivers. Many studies have noted the prevalence of the use of sand substrate by this species (Bramblett 1996; Bramblett and White 2001; Hurley 1999; Hurley et al. 2004b; Peters and Parham 2008; Snook 2001; Snook et al. 2002; Swigle 2003; all as cited in Peters and Parham 2008). Pallid sturgeon inhabit areas where temperatures range from 32 to 86° Fahrenheit, which is the range of water temperatures in the Missouri River.

The Study Area is located within one of the six RPMAs designated for the pallid sturgeon in the Mississippi and Missouri river basins. The upper Missouri River is composed of RPMAs 1, 2, and 3. RPMA 3 is an isolated section of habitat between Fort Randall Dam and Lewis and Clark Lake, and includes the 39-Mile District of the MNRR. This reach receives water from the Niobrara River. USFWS selected the RPMAs based on the most recent records of occurrence and on the probability that these areas still provide suitable habitat for the pallid sturgeon and have significant potential to contribute to the restoration and recovery of the species. Although this reach had habitat that originally supported wild pallid sturgeon (Keenlyne 1989, as cited in Peters and Parham 2008), today this section of the Missouri River and the lower portion of the Niobrara River contain only a stocked population of pallid sturgeon. The population in this reach has

been studied intensively (Wanner et al. 2007a; Wanner et al. 2007b; both as cited in Peters and Parham 2008). Currently, there are no known occurrences of the pallid sturgeon within the Study Area.

Potential Habitat in the Study Area

The wetlands along the floodplains within the Study Area are not suitable habitat for pallid sturgeon because while there is a direct hydrologic connection to the Missouri River, the wetlands do not contain the swift currents and turbid waters that characterize pallid sturgeon habitat.

Lake Sturgeon

The lake sturgeon (*Acipenser fulvescens*) is a federal species of concern and is state-listed as endangered in Nebraska. In Nebraska, lake sturgeon exist in the Missouri and Platte rivers.

Lake sturgeon are benthic and found near gravel or rocky substrate in the Missouri and lower Platte rivers. This species inhabits large rivers, lakes, and reservoirs where small benthic organisms, such as snails, crayfish, and aquatic insect larvae, are abundant. Lake sturgeon are most often associated with deep run and pool habitats of rivers and generally avoid aquatic vegetation (Hay-Chmielewski and Whelan 1997). Gravelly tributary streams of rivers and lakes serve as spawning habitat (Goforth 2000).

Currently, there are no known occurrences of lake sturgeon in the Study Area and its associated watercourses. This species was included in this discussion because it is a riverine species and has the potential to migrate into the associated waterways of the Study Area; however, the Nebraska Natural Heritage Database has no records of this species upstream of Gavins Point Dam (NGPC2010b).

Potential Habitat in the Study Area

The wetlands along the floodplains within the Study Area contain extensive beds of aquatic vegetation, which are typically avoided by lake sturgeon. Because of this, the Study Area lacks suitable habitat for lake sturgeon.

Sturgeon Chub

The sturgeon chub (*Macrhybopsis gelida*) is a former candidate species (removed on October 30, 2001 [66 FR 54807-54832]). The sturgeon chub is also state-listed as endangered in Nebraska.

Historically in Nebraska, sturgeon chub were found in the Missouri River along the eastern side of the state and in scattered locations in the lower Niobrara River, Republican River, Loup River, Elkhorn River, Platte River, and Bazile Creek. Recent records have found sturgeon chub only in the Missouri and Platte rivers. There are only historical occurrences of this species in Bazile Creek.

Sturgeon chub are benthic and found in large free-flowing riverine systems characterized by swift flows, high variable flow regimes, braided channels, high turbidity, and sand or fine gravel substrates. Sturgeon chub have been collected in side chutes and backwaters, which they may use for spawning. This species is often captured with a fish of the same genus, a sicklefin chub (*Macrhybopsis meeki*), and in water 6 to 16 feet deep (USFWS 2001). Berry et al. (2004) conducted a survey of benthic fishes in the Missouri River and found sturgeon chub most closely associated with sandy substrates with more gravel than silt and in relatively high velocity areas. In areas where sturgeon chub were captured, "silt was significantly less and substrate geometric mean size was significantly higher than at sites without fish" (Berry et al. 2004). During this survey, no sturgeon chub were captured in the Fort Randall segment of the Missouri River. The sturgeon chub diet consists of small aquatic insects.

Currently, there are no known occurrences of sturgeon chub in the Study Area and its associated waterways. This species was included in this discussion because it is a riverine species and has the potential to migrate into the associated waterways in the Study Area; however, the Nebraska Natural Heritage Database has no records of this species upstream of Gavins Point Dam (NGPC 2010b).

Potential Habitat in the Study Area

Although there have been no known occurrences of sturgeon chub in the Study Area, the floodplain wetlands and Bazile Creek contain habitat that could be used by this small fish species.

North American River Otter

The North American river otter (*Lontra canadensis*) is a long, slender, partially aquatic mammal. This species was state-listed as endangered in 1980 and was down-listed to threatened status in 2005 after a series of successful reintroductions (Boyle 2006). Because the North American river otter is not a federally listed threatened or endangered species, its presence or absence is not subject to federal Section 7 requirements for consultation with USFWS.

NGPC released North American river otters at seven sites between 1986 and 1991, including sections of the Niobrara River in Sheridan County. Recent observations suggest that North American river otters have become established in several Nebraska watersheds. North American river otters are highly mobile, moving in response to food availability or environmental conditions, making home range size and location extremely dynamic. This species requires a large amount of space to meet its annual requirements. At any given time, otters may occupy only a few miles of stream but will often move from one area to another.

North American river otters are social animals that hunt and travel together, using the same resting sites, latrines, and dens. This species is active year-round and does not migrate. Breeding can occur in March and April but is extremely variable. Breeding may

take place on land or in water and may occur anywhere within the female's home range. Females give birth and rear young in abandoned dens of other aquatic mammals. Natal dens may occasionally be found up to a few hundred feet from water.

The North American river otter's diet consists primarily of fish but may also include crustaceans, mollusks, insects, birds, and small mammals. Species that have been reported as preying on river otters include the gray wolf (*Canis lupus*), bobcat (*Lynx rufus*), mountain lion (*Puma concolor*), red fox (*Vulpes vulpes*), and bald eagle. Threats to the North American river otter include destruction and degradation of habitat, water pollution, human settlement and recreational use of riparian areas, and incidental trapping and illegal take (Boyle 2006).

Currently, there are no known populations of North American river otters in the Study Area. This species was included because it is highly mobile, and documented sightings have occurred several miles upstream of the confluence of the Niobrara and Missouri rivers (NGPC 2010b). Documented sightings were also confirmed near the confluence of the Niobrara and Missouri rivers during the 2010/2011 furbearer survey conducted by NGPC (Wilson 2011). The Niobrara River is a tributary to the Missouri River and could be a possible conduit for movement of North American river otters into portions of the Study Area that connect to the Missouri River.

Potential Habitat in the Study Area

The floodplain wetlands, Bazile Creek, and other tributaries to the Missouri River contain characteristics appropriate for North American river otter habitat. These river otters could potentially use the floodplain wetlands and tributaries for foraging.

Northern Long-Eared Bat

The northern long-eared bat (*Myotis septentrionalis*) was federally listed as threatened on May 4, 2015 (80 FR 17974-18033). No critical habitat has been designated for this species.

The northern long-eared bat is found throughout the eastern two-thirds and along the northern portion of the state of Nebraska (USFWS 2015c). During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags. Females typically roost from late May to early June to late July. Males and non-reproductive females may also roost in cooler places, like caves and mines. Northern long-eared bats have also been found rarely roosting in structures, like barns and sheds (USFWS 2015d).

Potential Habitat in Study Area

There are no known records of northern long-eared bat in Knox County, but there are records in the neighboring Holt County (NatureServe 2014). There is potential for the bat to roost in the woodlands located within the Study Area.

Small White Lady's Slipper

The small white lady's slipper (*Cypripedium candidum*) is state-listed as threatened in Nebraska; however, it is not a federally listed species. Because it is not a federally listed threatened or endangered species, the presence or absence of this species is not subject to federal Section 7 requirements for consultation with USFWS.

The small white lady's slipper in Nebraska has been associated with northern sedge fen meadows, northern cordgrass wet prairies, and mesic to wet tallgrass prairies (eFloras.org 2010). In addition, some individual small white lady's slipper plants have been identified in roadside ditches and growing in association with bromegrass (*Bromus inermis*) and Kentucky bluegrass (*Poa pratensis*), although this has not been documented as typical habitat. This species blooms from the end of May through early June. There are no known populations of small white lady's slipper in the Study Area.

Potential Habitat in the Study Area

No fens or mesic to wet tallgrass prairies exist within the Study Area. Therefore, suitable habitat for small white lady's slippers does not exist within the Study Area.

Western Prairie Fringed Orchid

The Western prairie fringed orchid (*Platanthera praeclara*) was federally listed as threatened on September 28, 1989 (54 FR 39857-39863). On March 30, 2006, USFWS initiated a 5-year review of this species (71 FR 16176-16177), which was completed and summarized in February 2009 (USFWS 2009e). No critical habitat has been designated for this species.

In Nebraska, the Western prairie fringed orchid is found in the eastern two-thirds of the state, from Cherry and Keith counties in the west to the Missouri River in the east. This species is a perennial orchid found in wet-mesic to mesic tallgrass prairie, specifically in unplowed, calcareous prairies and sedge meadows. The soils in this region are usually Udolls or Udic Ustolls (humid to intermittently dry mollisols, or prairie soils) on gentle to moderate slopes. In tallgrass prairies, the Western prairie fringed orchid is typically associated with big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), and Indiangrass (*Sorghastrum nutans*). This species is commonly associated with tufted hairgrass (*Deschampsia caespitosa*) and switchgrass (*Panicum virgatum*) in wetter growth sites. In sedge meadows, this species is often dominated by sedges (*Carex* spp.) and spikerushes (*Eleocharis* spp.) (USFWS 1996). There is evidence that orchid ecology is tied to mycorrhizal associations (that is, a symbiotic relationship between soil fungi and roots of plants) (USFWS 2009e). In Nebraska, this orchid blooms almost exclusively from the last week of June through the first two weeks of July. Flowering may be suppressed by litter accumulation and stimulated by fire (USFWS 1996).

Surveys completed in 1996 by USFWS for the Western Prairie Fringed Orchid Recovery Plan documented known populations in six counties in Nebraska (USFWS 1996).

Currently, extant populations are known to occur in 18 counties and may occur at other sites in Nebraska. Currently, there are no known populations of Western prairie fringed orchids in Knox County or in the Study Area.

Potential Habitat in the Study Area

Wetlands identified within the ROW in the Study Area contain monotypic stands of reed canarygrass (*Phalaris arundinacea*) and cattails (*Typha* spp.). The wetlands located in the floodplains contain a wetter regime than that preferred by Western prairie fringed orchid and have been disturbed by farming and fluctuating water levels in the past. Wet habitat in the bluffs has been highly disturbed by grazing. Therefore, the Study Area lacks suitable habitat for Western prairie fringed orchids.

III. Methodology of Impact Analysis

Data on protected species with the potential to occur in the Study Area were gathered from USFWS, NGPC, and the Nebraska Natural Heritage Program. Federally and state-listed species were derived from the following: 1) county lists of federally listed threatened, endangered, and candidate species maintained by USFWS; 2) county lists of federally and state-listed species maintained by NGPC; and 3) occurrences of rare, threatened, and endangered species in the State of Nebraska tracked by the Nebraska Natural Heritage Program.

To determine land use, the Study Area was superimposed on aerial photographs and overlaid with the 2011 National Land Cover Database coverage (USGS 2014) to categorize habitat types using ArcGIS software. NDOR's wetland delineation data were used to identify wetlands and other waters of the U.S. (see Appendix F). A visual windshield survey was conducted on September 28 and 29, 2008 to verify the documented habitats. Habitat types are defined in the Fish and Wildlife Technical Memorandum (see Appendix D). Within the Study Area, there are 1,687 acres of rangeland/grassland, 897 acres of woodlands, 1,414 acres of wetlands, and 134 acres of agricultural land.

Wetland resources beyond the Study Area were evaluated based on aerial photographs and habitat mapping conducted by the Corps (2011). Based on this wetland mapping, there are approximately 4,764 acres of wetland habitat directly connected to the Missouri River from Bazile Creek to Santee, Nebraska (Corps 2011). Additionally, based on the UNL 2005 Land Use Coverage and the NDOR determinations, there are approximately 1,414 acres of wetlands within the Study Area from Ponca Creek downstream to Bazile Creek, which yields a conservative total of approximately 6,100 acres of wetlands between Ponca Creek and Santee, Nebraska.

Impacts were analyzed for all federally and state-listed threatened or endangered species potentially occurring in the Study Area. If a species is known to occur within the Study Area, direct effects on the species were assessed quantitatively using Geographic

Information System (GIS) software to overlay alternative alignments on maps of associated habitat types for each individual species.

Permanent impacts on wetland habitat could occur in areas that are permanently filled by the Project. Permanent impacts on grassland/rangeland, woodland and agriculture habitats will occur from conversion to right-of-way. Potential effects were evaluated for the loss or disturbance of habitat and potential for affecting species population, viability, distribution, travel, and reproduction. Findings on the potential effects on federally-listed threatened or endangered species were based on the determination language used by USFWS (1998). State-listed only species are described similarly, although they are not subject to Section 7(a) of ESA. Protected species resources effects were classified the conclusions as described below (USFWS and National Marine Fisheries Service 1998):

- No effect – The appropriate conclusion when the action agency determines its proposed action will not affect a listed species or designated critical habitat
- May affect - The appropriate conclusion when a proposed action may pose any effects on listed species or designated critical habitat. When a Federal agency proposing the action determines that a "may affect" situation exists, then they must either initiate formal consultation or seek written concurrence from USFWS:
    - May affect, not likely to adversely affect – The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.
    - May affect, likely to adversely affect – The appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial.

IV. Impact Analysis

A. Effects Common to All Action Alternatives

Bald Eagle

Bald eagles will tolerate moderate levels of noise and human disturbance around a roosting site but prefer low activity. The National Bald Eagle Management Guidelines provide recommendations for avoiding disturbance to nesting sites consistent with the BGEPA and the MBTA. In the vicinity of the Project, bald eagles typically begin laying eggs in February, and young are fledged by the end of August. The National Bald Eagle Management Guidelines recommend avoiding active nests during this period by a maximum distance of 660 feet if the activity will be visible from the nest (USFWS 2007a).

Two active bald eagle nests are known to occur near the Study Area. One nest is located along the Niobrara River and is approximately 1 mile from any of the alternatives. The other nest is located several miles upstream of the confluence of the Missouri and Niobrara rivers. Neither of these nests would be impacted by any of the alternatives because the nests exist outside of the Study Area and are located greater than 0.5 mile from each alternative. All alternatives would have no effect on bald eagles in the Study Area.

Piping Plover

The alternatives would have no effect on the piping plover because no suitable breeding or foraging habitat exists for this species within the Study Area.

Rufa Red Knot

The alternatives would have no effect on the rufa red knot because no suitable foraging habitat exists for this species within the Study Area.

Pallid Sturgeon

There are no known occurrences of this species within the Study Area. It is not likely that this species would be encountered in the floodplain wetlands because the species primarily utilizes main channel, secondary channel and channel border habitats associated with engineered structures. They are only known to utilize inundated floodplain habitats when there is flowing water associated with historic discharges from the dams (USFWS 2014). Because of the direct hydrologic connection between the wetlands and the Missouri River, there is some potential during high water periods for accidental incursion into the Study Area. However, the habitat within the Study Area is not typically considered suitable for or preferable to the pallid sturgeon. Because of the lack of suitable habitat within the floodplain and bluff alternatives, all alternatives would have no effect on pallid sturgeon.

Lake Sturgeon

There are no known occurrences of this species in the Study Area. Because lake sturgeon use similar habitat and have similar life histories to pallid sturgeon, the potential impacts on lake sturgeon from the alternatives would be similar to those described above. All alternatives would have no effect on lake sturgeon.

Sturgeon Chub

There are no known occurrences of sturgeon chub in the Fort Randall section of the Missouri River. Suitable habitat exists for the sturgeon chub; however, the preferred habitat of this species exists in the main channel of the Missouri River, not within the wetlands potentially impacted by the alternatives. Any use of the floodplain wetlands by sturgeon chub would be transient and migratory in nature. Due to the scarcity of this fish and the lack of suitable habitat within the Study Area, all alternatives are not likely to impact sturgeon chub.

North American River Otter

Recorded occurrences of the North American river otter identify the species on the Niobrara River several miles upstream from the confluence of the Missouri River. However, this species is highly mobile and could be using habitat in the Missouri River. This species could occur in areas located along the Missouri River floodplain and associated tributaries. Although Alternatives A1, A2, A3, and A7 exist in the floodplain, it is not likely that these alternatives would adversely affect North American river otters because they are a very mobile species and would likely avoid areas of construction. All alternatives could cause mortality to North American river otters from vehicle-wildlife collisions; however, all action alternatives would incorporate several wide bridges and culverts to facilitate fish and wildlife movement under the roadway to avoid vehicle-wildlife collisions. Additionally, no vehicle-otter collisions have been reported or documented throughout the existence of the N-12 roadway. All alternatives are not likely to impact North American river otters.

Small White Lady's Slipper

No known populations of small white lady's slipper occur in the Study Area. All alternatives would have no effect on the small white lady's slipper because the Study Area contains no suitable habitat for the species.

Western Prairie Fringed Orchid

No known populations of western prairie fringed orchid occur in the Study Area. All alternatives would have no effect on the western prairie fringed orchid because the Study Area contains no suitable habitat for the species.

B. No-Action Alternative

Under the No-Action Alternative, improvements to N-12 would not be constructed. Continued roadway maintenance would primarily occur within existing right-of-way and would have no effect on threatened or endangered species.

C. Action Alternatives

Interior Least Tern

Although interior least terns may use the Missouri River corridor and the Niobrara River during migration and breeding seasons, the Missouri River wetlands in the vicinity of the Action Alternatives, while connected to the river hydrologically, do not contain suitable breeding or nesting habitat for this species. The Action Alternatives would impact approximately 91 to 147 acres of wetlands and open waters. Since interior least terns may forage long distances from their nests for minnows or small fish, the amount of impacts is considered insignificant and discountable because these impacts would occur on less than 2 percent of the total wetland habitat, both within the Study Area and downstream to the Lewis and Clark Lake delta area of the floodplain. Thousands of

acres of additional habitat are available within the interior least tern's range. Therefore, the Action Alternatives may affect, but are not likely to adversely affect, interior least terns.

Whooping Crane

Whooping cranes may use the Missouri River corridor, associated tributaries, and the Niobrara River during migration; however, the Study Area is located on the eastern edge of the central flyway used by this species. The Action Alternatives would impact approximately 91 to 147 acres of wetlands and open waters. Such impacts could indirectly affect whooping cranes, which may forage in these areas; however, this slight amount of impact is not likely to adversely affect this species because these impacts would occur to approximately 2 percent of the total wetland habitat within the Study Area and downstream to the Lewis and Clark Lake delta. Thousands of acres of additional foraging habitat are available within the whooping crane's range. Based on the rarity of sightings in the Study Area and relative location of the Project to the central flyway within the Study Area, the Action Alternatives may affect, but are not likely to adversely affect, the whooping crane.

American Burying Beetle

The ABB is found in a variety of habitats. No strong correlation tying soil type or land use to the ABB's habitat selection has been identified in Nebraskan occurrences of the species; however, adequate soil moisture levels appear to be critical (Hoback 2008). Although no documented occurrences exist within the Study Area, potential ABB habitat may be disturbed or lost during construction and operation of the N-12 roadway. Most likely, impacts would be due to construction, such as removal and compaction of soils that are important to the ABB's life cycle. Once earth has been compacted and pavement has been laid, the affected soil is unlikely to be suitable habitat for the ABB. Additionally, during earth work, appropriate-sized carrion for the ABB's food and reproduction requirement may also be temporarily displaced.

Although the ABB uses a variety of habitats, the north-central Sandhills population of ABB appears to prefer grassland prairie; forest edge; open woodlands with grasslands; and mesic areas, such as wet meadows, streams, and wetlands in association with relatively undisturbed semi-arid sandhill and loam grasslands. The ABB would likely not be found in the deeper water wetland habitats located directly adjacent to the Missouri River floodplain because the ABB has never been described as occurring in deeper-water wetland habitats in the literature (USFWS 2008). Based on this information, grasslands and woodlands along bluffs would be more suitable than the wetlands in the Action Alternatives, which are mostly inundated and too wet to provide suitable habitat for this species. To determine impacts on the ABB by alternative, woodland and grassland acres were calculated for each alternative because these habitats could contain potential habitat within the Study Area.

Between 22 and 123 acres of potential ABB habitat could be impacted under the Action Alternatives, with more acres of grasslands and woodlands impacted in the east segment than in the west segment. See Table 3 for impacts of each alternative, by segment, on potential ABB habitat (woodlands and grasslands). When compared to the total acres of potential ABB habitat within the Study Area, all of the Action Alternatives would have a negligible effect because they are affecting less than 5 percent of all available potential habitat. A survey would be conducted for this species prior to construction. If appropriate conservation conditions are followed, all Action Alternatives may affect, but are not likely to adversely affect, the ABB, if present.

Northern Long-Eared Bat

The Action Alternatives would impact between 8 and 67 acres of woodland habitat. There are 897 acres of woodland habitat within the Study Area, which means that only a maximum of 7 percent of the available habitat would be affected. A habitat survey should be conducted prior to construction. In addition, NDOR would be able to clear and grub the woodland areas outside of the northern long-eared bat's roosting season. Therefore, the Action Alternatives may affect, but are not likely to adversely affect, northern long-eared bats.

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Table 3
Impacts on Potential American Burying Beetle Habitat by Alternative and Segment

Habitat (acres)	Total Acres in Study Area	Alternative A1		Alternative A2		Alternatives A3		Alternative A7	
		West	East	West	East	West	East	West	East
Woodland/Rangeland	2,584	8	14	7	28	48	75	48	75
Total Acres of Potential ABB Habitat		22		35		123		123	
Percentage of Potential ABB Habitat Impacted	NA	<1%		1%		5%		1%	

Note:
Habitat impacts were calculated using the area in the proposed right-of-way (ROW) that is outside of existing ROW.

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V. References

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